

REMARKS

Rejections Under 35 USC §103

Claims 1-20 and 42-44 have been rejected under 35 USC §103(a) as being unpatentable over Krall (US Patent No. 4,713,235) in view of either Chorbadjiev et al. (article entitled "The effect of fillers upon properties of electroconductive cyanoacrylate adhesives from the International Journal of Adhesion and Adhesives July 1988), and either Loctite 410 or Loctite 416, optionally taken with the state of the prior art as exemplified by at least one of Liang et al. (US Patent No. 5,233,131), Fogal et al. (US Patent No. 5,140,404), Farnworth (US Patent No. 5,218,229), Davis (US Patent No. 5,214,307) and German Patent 4107347.

Claims 21, 22, 40 and 41 have been rejected under 35 USC §103(a) as being unpatentable over the admitted prior art in view of JP 58196280.

The 35 USC §103 rejections are traversed for the reasons to follow.

35 USC §103 Rejections Over Krall, Chorbadjiev et al., Loctite 410 and 416, Liang et al., Fogal et al., Farnworth, Davis and German Patent 4107347

The claims have been amended to include additional recitations which further distinguish the claimed method from the prior art. In particular, each of the independent claims include recitations on process parameters to achieve a stated thickness of the cyanoacrylate adhesive layer (20-Figure 1B). Independent claim 1 includes the recitation of "the pressure and the volume selected to form an adhesive layer between the die and the leadframe about 0.2 to 2 mils thick". Independent claims 6 and 42, and dependent claims 13 and 16, include similar recitations. Antecedent basis for these recitations is contained on page 7, lines 32-34

of the specification, on page 11, line 24 of the specification, and on page 12, line 3 of the specification.

Independent claims 12, 15 and 42, and dependent claims 5 and 11, include recitations on the volume of the adhesive material "containing about 0.0025 to 0.0011 grams". Antecedent basis for these recitations is contained on page 7, lines 30-32 of the specification. Independent claims 12, 15 and 42 include recitations on the pressure with which the adhesive material is pressed, as being "from 75 to 100 grams". Antecedent basis for these recitations is contained on page 10, lines 1-2 of the specification.

The prior art does not teach the claimed method for attaching a semiconductor die to a leadframe using a cyanoacrylate material in combination with volume and pressure parameters for achieving an adhesive layer with the stated thickness.

The primary reference to Krall states at column 1, lines 47-49: "For instance, in the manufacture of electronic microchips it has been suggested that MCA may be useful adhesive for joining contact leads to the chips." However, there are no teachings in Krall which would enable the present semiconductor packaging method with the stated volume, pressure and thickness parameters. The secondary references also do not contain specific teaching on the presently claimed volume, pressure and thickness parameters.

Further, the stated volume, pressure and thickness parameters, in the context of a method for attaching a die to a leadframe with a cyanoacrylate adhesive layer, are submitted to represent more than just routine experimentation. In this regard, one indicia of unobviousness is improved results and advantages. The thinness of the present cyanoacrylate adhesive layer provides a reduced package profile and faster curing times, but without compromising strength. It is a basic tenet of

patent layer that the PTO is not permitted to ignore the results and advantages produced by claimed subject matter. Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675, 7 USPQ2d 1315 (Fed. Cir. 1988); Carl Schenck, A.G. v Norton Corp., 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983).

35 USC §103 Rejections Over Admitted Art and German Patent 4107347

Independent claim 21 has been amended to include the recitation of "the pressure and the volume selected to form an adhesive layer about 0.2 to 2 mils thick". Neither the admitted art, nor the German patent, teach the formation of an anaerobic acrylic adhesive layer between a semiconductor die and leadframe with the stated thickness. Amended dependent claims 22 states "the volume contains about 0.0025 to 0.0011 grams of the adhesive material and the pressure is about 75 to 100 grams". Neither the admitted art, nor the German patent, teach the stated volume and pressure parameters for forming an anaerobic acrylic adhesive layer between a semiconductor die and leadframe with the stated thickness.


Conclusion

An Information Disclosure Statement is being filed concurrently with this Amendment. US Patent No. 6,646,354 B2 is a continuation-in-part of the present application. US Patent Nos. 6,709,896 B1 and 6,699,928 B2 are divisions of US Patent No. 6,646,354 B2.

In view of the amendments and arguments, favorable consideration and allowance of claims 1-22, and 40-44 is requested. Should any issues remain, the Examiner is asked to contact the undersigned by telephone.

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Date of Signature


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